AMENDMENTS TO THE CLAIMS

Following is a listing of all claims in the present application, which listing supersedes all previously presented claims:

Listing of Claims:

1. (Currently Amended) A droplet ejector, comprising:

a fluid path through which a fluid moves, a nozzle being formed on one end of the fluid path;

a volumetric structure formed in the fluid path, the volumetric structure being sensitive to an external stimulus and being capable of varying in size to eject a droplet of the fluid through the nozzle; and

a stimulus generator, which applies a stimulus to the volumetric structure to vary a size of the volumetric structure, wherein the droplet ejector is configured to eject the droplet of fluid upon application of the stimulus.

2. (Original) The droplet ejector as claimed in claim 1, wherein the volumetric structure expands in size to eject the droplet through the nozzle, and the stimulus generator applies the stimulus to the volumetric structure to expand the size of the volumetric structure.

3. (Original) The droplet ejector as claimed in claim 2, wherein the volumetric structure is formed of stimulus sensitive hydrogel.

4. (Original) The droplet ejector as claimed in claim 3, wherein the stimulus sensitive hydrogel is electrical field sensitive hydrogel.

5. (Original) The droplet ejector as claimed in claim 4, wherein the fluid path comprises:

a chamber, which is filled with the fluid to be ejected and is formed under the nozzle; and

a channel for supplying the fluid to the chamber,

wherein the volumetric structure is formed in the chamber.

6. (Original) The droplet ejector as claimed in claim 5, wherein the volumetric structure has a columnar shape, a hexahedral shape, or a cylindrical shape.

7. (Original) The droplet ejector as claimed in claim 5, wherein the stimulus generator is a pair of electrodes respectively disposed above and below the volumetric structure.

8. (Currently Amended) The droplet ejector as claimed in claim 36 [[7]], wherein the stimulus generator includes a pair of electrodes, one of the pair of electrodes being [[is]] a cathode,

the volumetric structure is an electrical field sensitive hydrogel that varies in volume towards the cathode first, and

the cathode is disposed between [[above]] the volumetric structure and the nozzle.

9. (Withdrawn) The droplet ejector as claimed in claim 5, wherein the stimulus generator is a pair of electrodes respectively disposed at either side of the volumetric structure.

10. (Withdrawn) The droplet ejector as claimed in claim 1, wherein the volumetric structure contracts in size to eject the droplet through the nozzle, and the stimulus generator applies the stimulus to the volumetric structure to contract the size of the volumetric structure.

11. (Withdrawn) The droplet ejector as claimed in claim 10, wherein the volumetric structure is formed of stimulus sensitive hydrogel.

12. (Withdrawn) The droplet ejector as claimed in claim 11, wherein the stimulus sensitive hydrogel is temperature sensitive hydrogel.

13. (Withdrawn) The droplet ejector as claimed in claim 12, wherein the stimulus generator is a resistance heating material for applying heat to the volumetric structure.

14. (Withdrawn) The droplet ejector as claimed in claim 13, wherein the fluid path comprises:

a chamber, which is filled with the fluid to be ejected and is formed under the nozzle; and

a channel for supplying the fluid to the chamber.

15. (Withdrawn) The droplet ejector as claimed in claim 14, wherein the volumetric structure is formed in the channel.

16. (Withdrawn) The droplet ejector as claimed in claim 15, wherein the volumetric structure has a columnar shape or a hexahedral shape.

17. (Withdrawn) The droplet ejector as claimed in claim 14, wherein the volumetric structure is formed in the nozzle.

18. (Withdrawn) The droplet ejector as claimed in claim 14, wherein the volumetric structure is formed in the chamber.

19. (Original) An ink-jet printhead, comprising:

a substrate on which a manifold for supplying ink is formed;

a barrier layer, which is stacked on the substrate and on which an ink chamber to be filled with ink to be ejected and an ink channel for providing communication between the ink chamber and the manifold are formed;

a nozzle plate, which is stacked on the barrier layer and in which a nozzle, through which an ink droplet is ejected, is formed;

a volumetric structure, which is formed in a position where ink moves, the volumetric structure being sensitive to an external stimulus and being capable of varying in size to eject the ink droplet through the nozzle; and

a stimulus generator, which applies a stimulus to the volumetric structure to vary a size of the volumetric structure.

20. (Original) The ink-jet printhead as claimed in claim 19, wherein the volumetric structure expands in size to eject the ink droplet through the nozzle, and the stimulus generator applies the stimulus to the volumetric structure to expand the size of the volumetric structure.

21. (Original) The ink-jet printhead as claimed in claim 20, wherein the volumetric structure is formed of stimulus sensitive hydrogel.

22. (Original) The ink-jet printhead as claimed in claim 21, wherein the stimulus sensitive hydrogel is electrical field sensitive hydrogel.

23. (Original) The ink-jet printhead as claimed in claim 22, wherein the volumetric structure is formed in the ink chamber.

24. (Original) The ink-jet printhead as claimed in claim 23, wherein the volumetric structure has a columnar shape, a hexahedral shape, or a cylindrical shape.

25. (Original) The ink-jet printhead as claimed in claim 23, wherein the stimulus generator is a pair of electrodes respectively disposed above and below the volumetric structure.

26. (Original) The ink-jet printhead as claimed in claim 25, wherein one of the pair of electrodes is a cathode and is disposed above the volumetric structure.

27. (Withdrawn) The ink-jet printhead as claimed in claim 23, wherein the stimulus generator is a pair of electrodes respectively disposed at either side of the volumetric structure.

28. (Withdrawn) The ink-jet printhead as claimed in claim 19, wherein the volumetric structure contracts in size to eject the ink droplet through the nozzle, and the stimulus generator applies the stimulus to the volumetric structure to contract the size of the volumetric structure.

29. (Withdrawn) The ink-jet printhead as claimed in claim 28, wherein the volumetric structure is formed of stimulus sensitive hydrogel.

30. (Withdrawn) The ink-jet printhead as claimed in claim 29, wherein the stimulus sensitive hydrogel is temperature sensitive hydrogel.

31. (Withdrawn) The ink-jet printhead as claimed in claim 30, wherein the stimulus generator is a resistance heating material for applying heat to the volumetric structure.

32. (Withdrawn) The ink-jet printhead as claimed in claim 31, wherein the volumetric structure is formed in the ink channel.

33. (Withdrawn) The ink-jet printhead as claimed in claim 32, wherein the volumetric structure has a columnar shape or a hexahedral shape.

34. (Withdrawn) The ink-jet printhead as claimed in claim 31, wherein the volumetric structure is formed in the nozzle.

35. (Withdrawn) The ink-jet printhead as claimed in claim 31, wherein the volumetric structure is formed in the ink chamber.

36. (New) The droplet ejector as claimed in claim 2, wherein the volumetric structure exhibits a non-isotropic variation in size upon application of the stimulus.

37. (New) The droplet ejector as claimed in claim 2, wherein the volumetric structure is formed on a surface that defines a portion of the fluid path, and the volumetric structure expands in first and second directions upon application of the stimulus, the first and second directions being orthogonal to each other.

38. (New) The droplet ejector as claimed in claim 37, wherein the volumetric structure has a first end disposed on the surface that defines a portion of the fluid path, a second end opposite to the first end and a side portion connecting the first and second ends, and

wherein the side portion and the second end are exposed to the fluid.

39. (New) The droplet ejector as claimed in claim 4, wherein the volumetric structure is formed by a process that includes:

providing a pre-polymer mixture including:

acrylic acid;

2-hydroxyethylmethacrylate;

ethylene glycol dimethacrylate; and

2,2-dimethoxy-2-phenyl-acetophenone; and

photopolymerizing the pre-polymer mixture.

40. (New) The droplet ejector as claimed in claim 39, wherein the pre-polymer mixture includes the acrylic acid and the 2-hydroxyethylmethacrylate in about a 1:4 molar ratio; about 1 % by weight of the ethylene glycol dimethacrylate, based on the total weight of the pre-polymer mixture; and about 3 % by weight of the 2,2-dimethoxy-2-phenyl-acetophenone, based on the total weight of the pre-polymer mixture.